

Ch 5 Representative Problems '0910

Section 5.1:

- A particle starts at $x = 0$ and moves along the x -axis with $v(t) = t^2 + 1$, for $t \geq 0$. Where is the particle at $t = 5$ seconds? Approximate with 5 intervals using the LRAM, RRAM, and MRAM models.
- See also example 3 and problems #14 & 23.

Section 5.2:

- Write the following limit as a definite integral over the interval $[2, 3]$: $\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{1-c_k} \Delta x$.
- Use areas to evaluate the integral, $\int_a^b x dx$, $a > 0$.

Section 5.3:

- Find the average value of $f(x) = 4 - x^2$ on the interval $[0, 3]$. Does f actually take on this value during the interval, if so where? Is this necessary? Why or why not?

Section 5.4:

- The graph of the continuous function f with domain $[0, 8]$ is shown.
Let h be the function defined by $\int_1^x f(t) dt$.
- Find $h(1)$.
 - Is $h(0)$ positive or negative? Justify your answer.
 - Find the value of x for which $h(x)$ is a maximum.
 - Find the value of x for which $h(x)$ is a minimum.
 - Find the x -coordinates of all points of inflections of the graph of $y = h(x)$.
- Find $\frac{dy}{dx}$ of $\int_{x^2}^{x^3} \cos(2t) dt$.
- Evaluate $\int_0^{\frac{\pi}{2}} 4 \sec(x) \tan(x) dx$.
- See also Sect. 5.3 #19 – 30 and Sect. 5.4 #27 – 40.

Section 5.5:

- Approximate $\int_1^2 \frac{1}{x} dx$ using the Trapezoidal Rule, Simpson's Rule, and then find the exact value using the Fundamental Theorem.
- See also #9 and 29.